

# 2010\_11\_15\_Sequence\_Listing

## SEQUENCE LISTING

<110> STATENS SERUM INSTITUT  
ANDERSEN, Peter  
SKJOT, Rikke Louise Vinther

<120> TUBERCULOSIS VACCINE AND DIAGNOSTICS BASED ON THE MYCOBACTERIUM  
TUBERCULOSIS SAT-6 GENE FAMILY

<130> 0459-0752P

<140> US 10/723,908

<141> 2003-11-26

<160> 59

<170> PatentIn 2.0

<210> 1  
<211> 100  
<212> PRT  
<213> M. tuberculosis

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Asn Phe Glu Arg Ile Ser Gly Asp Leu Lys Thr Gln Ile Asp Gln Val  
20 25 30  
Glu Ser Thr Ala Gly Ser Leu Gln Gly Gln Trp Arg Gly Ala Ala Gly  
35 40 45  
Thr Ala Ala Gln Ala Ala Val Arg Phe Gln Glu Ala Ala Asn Lys  
50 55 60  
Gln Lys Gln Glu Leu Asp Glu Ile Ser Thr Asn Ile Arg Gln Ala Gly  
65 70 75 80  
Val Gln Tyr Ser Arg Ala Asp Glu Glu Gln Gln Gln Ala Leu Ser Ser  
85 90 95  
Gln Met Gly Phe  
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<210> 2  
<211> 95  
<212> PRT  
<213> M. tuberculosis

<400> 2  
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Ala Ile Gln Gly Asn Val Thr Ser Ile His Ser Leu Leu Asp Glu Gly  
20 25 30  
Lys Gln Ser Leu Thr Lys Leu Ala Ala Trp Gly Gly Ser Gly Ser  
35 40 45  
Glu Ala Tyr Gln Gly Val Gln Gln Lys Trp Asp Ala Thr Ala Thr Glu  
50 55 60  
Leu Asn Asn Ala Leu Gln Asn Leu Ala Arg Thr Ile Ser Glu Ala Gly  
65 70 75 80  
Gln Ala Met Ala Ser Thr Glu Gly Asn Val Thr Gly Met Phe Ala  
85 90 95

<210> 3  
<211> 96  
<212> PRT  
<213> M. tuberculosis

# 2010\_11\_15\_Sequence\_Listing

<400> 3  
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 1 5 10 15  
 Asp Met Ala Gly Tyr Ala Gly Thr Leu Gln Ser Leu Gly Ala Glu Ile  
 20 25 30  
 Ala Val Glu Gln Ala Ala Leu Gln Ser Ala Trp Gln Gly Asp Thr Gly  
 35 40 45  
 Ile Thr Tyr Gln Ala Trp Gln Ala Gln Trp Asn Gln Ala Met Glu Asp  
 50 55 60  
 Leu Val Arg Ala Tyr His Ala Met Ser Ser Thr His Glu Ala Asn Thr  
 65 70 75 80  
 Met Ala Met Met Ala Arg Asp Thr Ala Glu Ala Ala Lys Trp Gly Gly  
 85 90 95

<210> 4  
 <211> 294  
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 <213> M. tuberculosis

<220>  
 <221> CDS  
 <222> (1)...(294)

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 1 5 10 15  
 gcg ttt gcc gcc aag gcg ggg ctg atg cgg cac acg atc ggt cag gcc 96  
 Ala Phe Ala Ala Lys Ala Gly Leu Met Arg His Thr Ile Gly Gln Ala  
 20 25 30  
 gag cag gcg gcg atg tcg gct cag gcg ttt cac cag ggg gag tcg tcg 144  
 Glu Gln Ala Ala Met Ser Ala Gln Ala Phe His Gln Gly Glu Ser Ser  
 35 40 45  
 gcg gcg ttt cag gcc gcc cat gcc cgg ttt gtg gcg gcg gcc gcc aaa 192  
 Ala Ala Phe Gln Ala Ala His Ala Arg Phe Val Ala Ala Ala Lys  
 50 55 60  
 gtc aac acc ttg ttg gat gtc gcg cag gcg aat ctg ggt gag gcc gcc 240  
 Val Asn Thr Leu Leu Asp Val Ala Gln Ala Asn Leu Gly Glu Ala Ala  
 65 70 75 80  
 ggt acc tat gtg gcc gcc gat gct gcg gcc gcg tcg acc tat acc ggg 288  
 Gly Thr Tyr Val Ala Ala Asp Ala Ala Ala Ser Thr Tyr Thr Gly  
 85 90 95  
 ttc tga 294  
 Phe

<210> 5  
 <211> 97  
 <212> PRT  
 <213> M. tuberculosis

<400> 5  
 Met Ser Leu Leu Asp Ala His Ile Pro Gln Leu Val Ala Ser Gln Ser  
 1 5 10 15  
 Ala Phe Ala Ala Lys Ala Gly Leu Met Arg His Thr Ile Gly Gln Ala  
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Glu Gln Ala 20 Met Ser Ala Gln 25 Phe His Gln Gly 30 Glu Ser Ser  
 Ala 35 Phe Gln Ala Ala His 40 Ala Arg Phe Val Ala 45 Ala Ala Lys  
 Val 50 Asn Thr Leu Leu Asp 55 Val Ala Gln Ala Asn 60 Leu Gly Glu Ala Ala  
 65 Gly Thr Tyr Val 70 Ala Asp Ala Ala 75 Ala Ser Thr Tyr 80 Thr Gly  
 85 90 95  
 Phe

<210> 6  
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<220>  
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 1 5 10 15  
 ctt gtt gcg gaa ggg att gag gcc atc gtg ttt cgt act tta ggc gat 96  
 Leu Val Ala Glu Gly Ile Glu Ala Ile Val Phe Arg Thr Leu Gly Asp  
 20 25 30  
 cag tgc tgg ttg tgg gag tcg ctg ctg ccc gac gag gtg cgc cga ctg 144  
 Gln Cys Trp Leu Trp Glu Ser Leu Leu Pro Asp Glu Val Arg Arg Leu  
 35 40 45  
 ccc gag gaa ctg gcc cgg gtg gac gca ttg ttg gac gat ccg gcg ttc 192  
 Pro Glu Glu Leu Ala Arg Val Asp Ala Leu Leu Asp Asp Pro Ala Phe  
 50 55 60  
 ttc gcc ccg ttc gtg ccg ttc ttc gac ccg cgc agg ggc cgg ccg tcg 240  
 Phe Ala Pro Phe Val Pro Phe Phe Asp Pro Arg Arg Gly Arg Pro Ser  
 65 70 75 80  
 acg ccg atg gag gtc tat ctg cag ttg atg ttt gtg aag ttc cgc tac 288  
 Thr Pro Met Glu Val Tyr Leu Gln Leu Met Phe Val Lys Phe Arg Tyr  
 85 90 95  
 cgg ctg ggc tat gag tcg ctg tgc cgg gag gtg gct gat tcg atc acc 336  
 Arg Leu Gly Tyr Glu Ser Leu Cys Arg Glu Val Ala Asp Ser Ile Thr  
 100 105 110  
 tga 339

<210> 7  
 <211> 112  
 <212> PRT  
 <213> M. tuberculosis

<400> 7  
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 20 25 30  
 Gln Cys Trp Leu Trp Glu Ser Leu Leu Pro Asp Glu Val Arg Arg Leu

# 2010\_11\_15\_Sequence\_Listing

35  
 Pro Glu Glu Leu Ala Arg Val Asp Ala Leu Leu Asp Asp Pro Ala Phe  
 50 55 60  
 Phe Ala Pro Phe Val Pro Phe Phe Asp Pro Arg Arg Gly Arg Pro Ser  
 65 70 75 80  
 Thr Pro Met Glu Val Tyr Leu Gln Leu Met Phe Val Lys Phe Arg Tyr  
 85 90 95  
 Arg Leu Gly Tyr Glu Ser Leu Cys Arg Glu Val Ala Asp Ser Ile Thr  
 100 105 110

<210> 8  
 <211> 285  
 <212> DNA  
 <213> M. tuberculosis

<220>  
 <221> CDS  
 <222> (1)...(285)

<400> 8  
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 1 5 10 15  
 atc cgc gct cag gcc ggg tcg ctg gag gcc gag cat cag gcc atc att 96  
 Ile Arg Ala Gln Ala Gly Ser Leu Glu Ala Glu His Gln Ala Ile Ile  
 20 25 30  
 tct gat gtg ttg acc gcg agt gac ttt tgg ggc ggc gcc ggt tcg gcg 144  
 Ser Asp Val Leu Thr Ala Ser Asp Phe Trp Gly Gly Ala Gly Ser Ala  
 35 40 45  
 gcc tgc cag ggg ttc att acc cag ctg ggc cgt aac ttc cag gtg atc 192  
 Ala Cys Gln Gly Phe Ile Thr Gln Leu Gly Arg Asn Phe Gln Val Ile  
 50 55 60  
 tac gag cag gcc aac gcc cac ggg cag aag gtg cag gct gcc ggc aac 240  
 Tyr Glu Gln Ala Asn Ala His Gly Gln Lys Val Gln Ala Ala Gly Asn  
 65 70 75 80  
 aac atg gca caa acc gac agc gcc gtc ggc tcc agc tgg gcc taa 285  
 Asn Met Ala Gln Thr Asp Ser Ala Val Gly Ser Ser Trp Ala  
 85 90

<210> 9  
 <211> 94  
 <212> PRT  
 <213> M. tuberculosis

<400> 9  
 Met Thr Ile Asn Tyr Gln Phe Gly Asp Val Asp Ala His Gly Ala Met  
 1 5 10 15  
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 20 25 30  
 Arg Asp Val Leu Ala Ala Gly Asp Phe Trp Gly Gly Ala Gly Ser Val  
 35 40 45  
 Ala Cys Gln Glu Phe Ile Thr Gln Leu Gly Arg Asn Phe Gln Val Ile  
 50 55 60  
 Tyr Glu Gln Ala Asn Ala His Gly Gln Lys Val Gln Ala Ala Gly Asn  
 65 70 75 80  
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 85 90

# 2010\_11\_15\_Sequence\_Listing

<210> 10  
 <211> 285  
 <212> DNA  
 <213> M. tuberculosis

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 <221> CDS  
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  1          5          10          15

atc cgc gct cag gcc ggg ttg ctg gag gcg gag cat cag gcc atc gtt      96
Ile Arg Ala Gln Ala Gly Leu Leu Glu Ala Glu His Gln Ala Ile Val
          20          25          30

cgt gat gtg ttg gcc gcg ggt gac ttt tgg ggc ggc gcc ggt tcg gtg     144
Arg Asp Val Leu Ala Ala Gly Asp Phe Trp Gly Gly Ala Gly Ser Val
          35          40          45

gct tgc cag gag ttc att acc cag ttg ggc cgt aac ttc cag gtg atc     192
Ala Cys Gln Glu Phe Ile Thr Gln Leu Gly Arg Asn Phe Gln Val Ile
          50          55          60

tac gag cag gcc aac gcc cac ggg cag aag gtg cag gct gcc ggc aac     240
Tyr Glu Gln Ala Asn Ala His Gly Gln Lys Val Gln Ala Ala Gly Asn
  65          70          75          80

aac atg gca caa acc gac agc gcc gtc ggc tcc agc tgg gcc             282
Asn Met Ala Gln Thr Asp Ser Ala Val Gly Ser Ser Trp Ala
          85          90

tga                                                                    285
    
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<210> 11  
 <211> 94  
 <212> PRT  
 <213> M. tuberculosis

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<400> 11
Met Thr Ile Asn Tyr Gln Phe Gly Asp Val Asp Ala His Gly Ala Met
  1          5          10          15
Ile Arg Ala Gln Ala Gly Leu Leu Glu Ala Glu His Gln Ala Ile Val
          20          25          30
Arg Asp Val Leu Ala Ala Gly Asp Phe Trp Gly Gly Ala Gly Ser Val
          35          40          45
Ala Cys Gln Glu Phe Ile Thr Gln Leu Gly Arg Asn Phe Gln Val Ile
  50          55          60
Tyr Glu Gln Ala Asn Ala His Gly Gln Lys Val Gln Ala Ala Gly Asn
  65          70          75          80
Asn Met Ala Gln Thr Asp Ser Ala Val Gly Ser Ser Trp Ala
          85          90
    
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<210> 12  
 <211> 327  
 <212> DNA  
 <213> M. tuberculosis

<220>  
 <221> CDS

# 2010\_11\_15\_Sequence\_Listing

<222> (1)...(327)

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Val	Leu	Leu	Pro	Leu	Gly	Pro	Pro	Leu	Pro	Pro	Asp	Ala	Val	Val	Ala	
1				5					10					15		

aaa	cgg	gct	gag	tcg	gga	atg	ctc	ggc	ggg	ttg	tcg	gtt	ccg	ctc	agc	96
Lys	Arg	Ala	Glu	Ser	Gly	Met	Leu	Gly	Gly	Leu	Ser	Val	Pro	Leu	Ser	
			20					25					30			

tgg	gga	gtg	gct	gtg	cca	ccc	gat	gat	tat	gac	cac	tgg	gcg	cct	gcg	144
Trp	Gly	Val	Ala	Val	Pro	Pro	Asp	Asp	Tyr	Asp	His	Trp	Ala	Pro	Ala	
		35					40					45				

ccg	gag	gac	ggc	gcc	gat	gtc	gat	gtc	cag	gcg	gcc	gaa	ggg	gcg	gac	192
Pro	Glu	Asp	Gly	Ala	Asp	Val	Asp	Val	Gln	Ala	Ala	Glu	Gly	Ala	Asp	
	50					55					60					

gca	gag	gcc	gcg	gcc	atg	gac	gag	tgg	gat	gag	tgg	cag	gcg	tgg	aac	240
Ala	Glu	Ala	Ala	Ala	Met	Asp	Glu	Trp	Asp	Glu	Trp	Gln	Ala	Trp	Asn	
65					70					75					80	

gag	tgg	gtg	gcg	gag	aac	gct	gaa	ccc	cgc	ttt	gag	gtg	cca	cgg	agt	288
Glu	Trp	Val	Ala	Glu	Asn	Ala	Glu	Pro	Arg	Phe	Glu	Val	Pro	Arg	Ser	
				85					90					95		

agc	agc	agc	gtg	att	ccg	cat	tct	ccg	gcg	gcc	ggc	tag				327
Ser	Ser	Ser	Val	Ile	Pro	His	Ser	Pro	Ala	Ala	Gly					
			100					105								

<210> 13

<211> 108

<212> PRT

<213> M. tuberculosis

<400> 13

Met	Leu	Leu	Pro	Leu	Gly	Pro	Pro	Leu	Pro	Pro	Asp	Ala	Val	Val	Ala	
1				5					10					15		
Lys	Arg	Ala	Glu	Ser	Gly	Met	Leu	Gly	Gly	Leu	Ser	Val	Pro	Leu	Ser	
			20					25					30			
Trp	Gly	Val	Ala	Val	Pro	Pro	Asp	Asp	Tyr	Asp	His	Trp	Ala	Pro	Ala	
		35					40				45					
Pro	Glu	Asp	Gly	Ala	Asp	Val	Asp	Val	Gln	Ala	Ala	Glu	Gly	Ala	Asp	
	50					55					60					
Ala	Glu	Ala	Ala	Ala	Met	Asp	Glu	Trp	Asp	Glu	Trp	Gln	Ala	Trp	Asn	
65					70					75					80	
Glu	Trp	Val	Ala	Glu	Asn	Ala	Glu	Pro	Arg	Phe	Glu	Val	Pro	Arg	Ser	
				85					90					95		
Ser	Ser	Ser	Val	Ile	Pro	His	Ser	Pro	Ala	Ala	Gly					
			100					105								

<210> 14

<211> 324

<212> DNA

<213> M. tuberculosis

<220>

<221> CDS

<222> (1)...(324)

<400> 14

# 2010\_11\_15\_Sequence\_Listing

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1 5 10 15	
aac gcc ccg cgt cgg aat cgc gtt ggg cgg caa cat ggt tgg ccg gcc	96
Asn Ala Pro Arg Arg Asn Arg Val Gly Arg Gln His Gly Trp Pro Ala	
20 25 30	
gac gtt ccg tcc gcc gag cag cgc cgc gcc caa cgg cag cgc gac ctc	144
Asp Val Pro Ser Ala Glu Gln Arg Arg Ala Gln Arg Gln Arg Asp Leu	
35 40 45	
gag gct atc cgc cga gcg tac gcc gag atg gtg gcg aca tca cac gaa	192
Glu Ala Ile Arg Arg Ala Tyr Ala Glu Met Val Ala Thr Ser His Glu	
50 55 60	
atc gac gac gac aca gcc gaa ctg gcg ctg ttg tcg atg cat ctc gac	240
Ile Asp Asp Asp Thr Ala Glu Leu Ala Leu Leu Ser Met His Leu Asp	
65 70 75 80	
gat gag cag cgc cgg ctt gag gcg ggg atg aag ctc ggc tgg cat ccg	288
Asp Glu Gln Arg Arg Leu Glu Ala Gly Met Lys Leu Gly Trp His Pro	
85 90 95	
tat cac ttc ccc gac gaa ccc gac agc aaa cag tga	324
Tyr His Phe Pro Asp Glu Pro Asp Ser Lys Gln	
100 105	

<210> 15  
 <211> 107  
 <212> PRT  
 <213> M. tuberculosis

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Met Thr His Lys Arg Thr Lys Arg Gln Pro Ala Ile Ala Ala Gly Leu
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20 25 30
Asp Val Pro Ser Ala Glu Gln Arg Arg Ala Gln Arg Gln Arg Asp Leu
35 40 45
Glu Ala Ile Arg Arg Ala Tyr Ala Glu Met Val Ala Thr Ser His Glu
50 55 60
Ile Asp Asp Asp Thr Ala Glu Leu Ala Leu Leu Ser Met His Leu Asp
65 70 75 80
Asp Glu Gln Arg Arg Leu Glu Ala Gly Met Lys Leu Gly Trp His Pro
85 90 95
Tyr His Phe Pro Asp Glu Pro Asp Ser Lys Gln
100 105

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 <213> M. tuberculosis

<220>  
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1 5 10 15	

# 2010\_11\_15\_Sequence\_Listing

gag ctt gtc ggc ggc ccg cca gtc gag gct tcg gcc gcc gcg ctg gcc Glu Leu Val Gly Gly Pro Pro Val Glu Ala Ser Ala Ala Ala Leu Ala	96
20 25 30	
ggc gac gcc gcg ggc gca tgg cgg acc gcg gcc gtc gag ctt gcg cga Gly Asp Ala Ala Gly Ala Trp Arg Thr Ala Ala Val Glu Leu Ala Arg	144
35 40 45	
gcg ttg gtc cgc gct gtg gcg gag tcg cac ggc gtc gcg gcc gtt ttg Ala Leu Val Arg Ala Val Ala Glu Ser His Gly Val Ala Ala Val Leu	192
50 55 60	
ttc gcc gcg acg gcc gcc gcg gcg gcg gcc gtc gac cgg ggt gat ccg Phe Ala Ala Thr Ala Ala Ala Ala Val Asp Arg Gly Asp Pro	240
65 70 75 80	
ccg tga Pro	246

<210> 17  
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 <212> PRT  
 <213> M. tuberculosis

<400> 17 Met Ser Gly His Ala Leu Ala Ala Arg Thr Leu Leu Ala Ala Ala Asp 1 5 10 15 Glu Leu Val Gly Gly Pro Pro Val Glu Ala Ser Ala Ala Ala Leu Ala 20 25 30 Gly Asp Ala Ala Gly Ala Trp Arg Thr Ala Ala Val Glu Leu Ala Arg 35 40 45 Ala Leu Val Arg Ala Val Ala Glu Ser His Gly Val Ala Ala Val Leu 50 55 60 Phe Ala Ala Thr Ala Ala Ala Ala Val Asp Arg Gly Asp Pro 65 70 75 80 Pro
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<210> 18  
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 <212> DNA  
 <213> M. tuberculosis

<220>  
 <221> CDS  
 <222> (1)...(294)

<400> 18 atg agt ttg ttg gat gcc cat att ccg cag ttg atc gct tcg cat acg Met Ser Leu Leu Asp Ala His Ile Pro Gln Leu Ile Ala Ser His Thr 1 5 10 15	48
gcg ttt gcc gct aag gcg ggg ttg atg cgg cat acg atc ggt cag gcc Ala Phe Ala Ala Lys Ala Gly Leu Met Arg His Thr Ile Gly Gln Ala 20 25 30	96
gag cag cag gcg atg tcg gcg cag gcg ttt cat cag gga gag tcc gcg Glu Gln Gln Ala Met Ser Ala Gln Ala Phe His Gln Gly Glu Ser Ala 35 40 45	144



# 2010\_11\_15\_Sequence\_Listing

gcg gcg ttt cag ggt gcg cat gcc cgg ttt gtg gcc gcg gcc gcc aag	192
Ala Ala Phe Gln Gly Ala His Ala Arg Phe Val Ala Ala Ala Ala Lys	
50 55 60	
gtc aat acc ttg ctg gat atc gcg caa gcc aat ttg ggt gag gcc gcg	240
Val Asn Thr Leu Leu Asp Ile Ala Gln Ala Asn Leu Gly Glu Ala Ala	
65 70 75 80	
ggc acg tat gtg gcc gcc gat gcc gcc gcc gcg tcc agc tac acc ggg	288
Gly Thr Tyr Val Ala Ala Asp Ala Ala Ala Ala Ser Ser Tyr Thr Gly	
85 90 95	
ttt tta	294
Phe Leu	

<210> 19  
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 <213> M. tuberculosis

<400> 19  
 Met Ser Leu Leu Asp Ala His Ile Pro Gln Leu Ile Ala Ser His Thr  
 1 5 10 15  
 Ala Phe Ala Ala Lys Ala Gly Leu Met Arg His Thr Ile Gly Gln Ala  
 20 25 30  
 Glu Gln Gln Ala Met Ser Ala Gln Ala Phe His Gln Gly Glu Ser Ala  
 35 40 45  
 Ala Ala Phe Gln Gly Ala His Ala Arg Phe Val Ala Ala Ala Ala Lys  
 50 55 60  
 Val Asn Thr Leu Leu Asp Ile Ala Gln Ala Asn Leu Gly Glu Ala Ala  
 65 70 75 80  
 Gly Thr Tyr Val Ala Ala Asp Ala Ala Ala Ser Ser Tyr Thr Gly  
 85 90 95  
 Phe

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tcc gtt cgt cag gag atc cac acc acc gcg gcc cgt ttc aac gct gcg	96
Ser Val Arg Gln Glu Ile His Thr Thr Ala Ala Arg Phe Asn Ala Ala	
20 25 30	
ctg caa gag ctg agg tcg cag atc gcg ccg ttg cag cag ctc tgg aca	144
Leu Gln Glu Leu Arg Ser Gln Ile Ala Pro Leu Gln Gln Leu Trp Thr	
35 40 45	
cgg gaa gcg gcc gcc gcc tac cac gcg gag caa ctc aag tgg cac cag	192
Arg Glu Ala Ala Ala Ala Tyr His Ala Glu Gln Leu Lys Trp His Gln	
50 55 60	

# 2010\_11\_15\_Sequence\_Listing

gcg gcc agc gcg ctc aac gag atc ctg atc gac ttg gga aac gcg gtt	240
Ala Ala Ser Ala Leu Asn Glu Ile Leu Ile Asp Leu Gly Asn Ala Val	
65 70 75 80	
cgc cac ggt gcc gac gac gtg gcg cat gcc gac cgg cgg gcg gct gga	288
Arg His Gly Ala Asp Asp Val Ala His Ala Asp Arg Arg Ala Ala Gly	
85 90 95	
gct tgg gca cgc tag	303
Ala Trp Ala Arg	
100	

<210> 21  
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 <212> PRT  
 <213> M. tuberculosis

<400> 21	
Met Asn Ala Asp Pro Val Leu Ser Tyr Asn Phe Asp Ala Ile Glu Tyr	
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Ser Val Arg Gln Glu Ile His Thr Thr Ala Ala Arg Phe Asn Ala Ala	
20 25 30	
Leu Gln Glu Leu Arg Ser Gln Ile Ala Pro Leu Gln Gln Leu Trp Thr	
35 40 45	
Arg Glu Ala Ala Ala Tyr His Ala Glu Gln Leu Lys Trp His Gln	
50 55 60	
Ala Ala Ser Ala Leu Asn Glu Ile Leu Ile Asp Leu Gly Asn Ala Val	
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Arg His Gly Ala Asp Asp Val Ala His Ala Asp Arg Arg Ala Ala Gly	
85 90 95	
Ala Trp Ala Arg	
100	

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 <212> DNA  
 <213> M. tuberculosis

<220>  
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Leu Val Glu Pro Gly Arg Ile Gly Gly Asn Gln Thr Arg Leu Ala Ala	
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gtc cta ctt gat gtg agc aca ccg aac acg ctg aac gcc gac ttt gac	96
Val Leu Leu Asp Val Ser Thr Pro Asn Thr Leu Asn Ala Asp Phe Asp	
20 25 30	
ctg atg cgt tcg gtt gcg ggt atc acg gac gcc cgc aat gag gaa atc	144
Leu Met Arg Ser Val Ala Gly Ile Thr Asp Ala Arg Asn Glu Glu Ile	
35 40 45	
cgt gcg atg ctg cag gca ttc atc ggc cgc atg agc ggt gtg ccg ccg	192
Arg Ala Met Leu Gln Ala Phe Ile Gly Arg Met Ser Gly Val Pro Pro	
50 55 60	
tcg gtg tgg ggt ggg ctc gcg gcc gct cgg ttc cag gat gtg gtg gat	240
Ser Val Trp Gly Gly Leu Ala Ala Ala Arg Phe Gln Asp Val Val Asp	

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65		70		75		80	
cgc tgg aac gcc gag tcg acg cgg ctc tac cac gtc ctg cac gcg atc							288
Arg Trp Asn Ala Glu Ser Thr Arg Leu Tyr His Val Leu His Ala Ile							
		85		90		95	
gcc gac acc atc cgc cac aac gag gcc gcg ctg cgg gaa gcc ggc caa							336
Ala Asp Thr Ile Arg His Asn Glu Ala Leu Arg Glu Ala Gly Gln							
		100		105		110	
atc cat gcc cgc cac atc gcc gcc gcc ggc ggc gac cta tag							378
Ile His Ala Arg His Ile Ala Ala Ala Gly Gly Asp Leu							
		115		120		125	

<210> 23  
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<400> 23																	
Met Val Glu Pro Gly Arg Ile Gly Gly Asn Gln Thr Arg Leu Ala Ala																	
1 5 10 15																	
Val Leu Leu Asp Val Ser Thr Pro Asn Thr Leu Asn Ala Asp Phe Asp																	
		20					25					30					
Leu Met Arg Ser Val Ala Gly Ile Thr Asp Ala Arg Asn Glu Glu Ile																	
		35				40					45						
Arg Ala Met Leu Gln Ala Phe Ile Gly Arg Met Ser Gly Val Pro Pro																	
		50			55				60								
Ser Val Trp Gly Gly Leu Ala Ala Ala Arg Phe Gln Asp Val Val Asp																	
		65		70				75								80	
Arg Trp Asn Ala Glu Ser Thr Arg Leu Tyr His Val Leu His Ala Ile																	
		85					90								95		
Ala Asp Thr Ile Arg His Asn Glu Ala Ala Leu Arg Glu Ala Gly Gln																	
		100				105						110					
Ile His Ala Arg His Ile Ala Ala Gly Gly Asp Leu																	
		115				120						125					

<210> 24  
 <211> 288  
 <212> DNA  
 <213> M. tuberculosis

<220>  
 <221> CDS  
 <222> (1)...(288)

<400> 24																	
atg tca gat caa atc acg tat aac ccg gga gcc gta tcc gac ttc gct																	
1 5 10 15																	
Met Ser Asp Gln Ile Thr Tyr Asn Pro Gly Ala Val Ser Asp Phe Ala																	
tcc gac gtg ggc tcg cgc gcc ggc cag ctc cac atg att tac gaa gac																	
		20					25					30					
Ser Asp Val Gly Ser Arg Ala Gly Gln Leu His Met Ile Tyr Glu Asp																	
acc gcc agc aaa aca aat gcg ctg caa gag ttt ttc gcg ggc cac ggc																	
		35					40					45					
Thr Ala Ser Lys Thr Asn Ala Leu Gln Glu Phe Phe Ala Gly His Gly																	
gcg caa ggg ttt ttc gac gcc cag gcg cag atg ctg tcg ggg ctg cag																	
		50				55					60						
Ala Gln Gly Phe Phe Asp Ala Gln Ala Gln Met Leu Ser Gly Leu Gln																	

# 2010\_11\_15\_Sequence\_Listing

ggg ctc att gag acg gtg ggt cag cat ggg act acc acc ggc cac gtg 240  
Gly Leu Ile Glu Thr Val Gly Gln His Gly Thr Thr Thr Gly His Val  
65 70 75 80

ctg gac aac gcg atc gga acc gac cag gcc atc gcg ggc ttg ttc taa 288  
Leu Asp Asn Ala Ile Gly Thr Asp Gln Ala Ile Ala Gly Leu Phe  
85 90 95

<210> 25  
<211> 95  
<212> PRT  
<213> M. tuberculosis

<400> 25  
Met Ser Asp Gln Ile Thr Tyr Asn Pro Gly Ala Val Ser Asp Phe Ala  
1 5 10 15  
Ser Asp Val Gly Ser Arg Ala Gly Gln Leu His Met Ile Tyr Glu Asp  
20 25 30  
Thr Ala Ser Lys Thr Asn Ala Leu Gln Glu Phe Phe Ala Gly His Gly  
35 40 45  
Ala Gln Gly Phe Phe Asp Ala Gln Ala Gln Met Leu Ser Gly Leu Gln  
50 55 60  
Gly Leu Ile Glu Thr Val Gly Gln His Gly Thr Thr Thr Gly His Val  
65 70 75 80  
Leu Asp Asn Ala Ile Gly Thr Asp Gln Ala Ile Ala Gly Leu Phe  
85 90 95

<210> 26  
<211> 324  
<212> DNA  
<213> M. tuberculosis

<220>  
<221> CDS  
<222> (1)...(324)

<400> 26  
gtg gca gac aca att cag gta aca ccg cag atg ctg cgc agc acc gcc 48  
Val Ala Asp Thr Ile Gln Val Thr Pro Gln Met Leu Arg Ser Thr Ala  
1 5 10 15

aac gat atc cag gcg aat atg gag caa gcc atg gga atc gcc aag ggc 96  
Asn Asp Ile Gln Ala Asn Met Glu Gln Ala Met Gly Ile Ala Lys Gly  
20 25 30

tac cta gcc aac cag gaa aac gtc atg aac ccc gcc acc tgg tct ggt 144  
Tyr Leu Ala Asn Gln Glu Asn Val Met Asn Pro Ala Thr Trp Ser Gly  
35 40 45

acc ggc gtc gtt gct tcg cat atg aca gcc acc gag atc acc aat gaa 192  
Thr Gly Val Val Ala Ser His Met Thr Ala Thr Glu Ile Thr Asn Glu  
50 55 60

ttg aac aag gtc ctt acc ggg ggc acg cgc ctg gcc gag ggc ctc gtg 240  
Leu Asn Lys Val Leu Thr Gly Gly Thr Arg Leu Ala Glu Gly Leu Val  
65 70 75 80

cag gcc gca gcc ctg atg gag gga cac gag gcg gac tcg cag aca gcg 288  
Gln Ala Ala Ala Leu Met Glu Gly His Glu Ala Asp Ser Gln Thr Ala  
85 90 95

## 2010\_11\_15\_Sequence\_Listing

324

ttt cag gcg ctg ttc ggc gct agc cac gga tcc tga  
 Phe Gln Ala Leu Phe Gly Ala Ser His Gly Ser  
 100 105

<210> 27  
 <211> 107  
 <212> PRT  
 <213> M. tuberculosis

<400> 27  
 Met Ala Asp Thr Ile Gln Val Thr Pro Gln Met Leu Arg Ser Thr Ala  
 1 5 10 15  
 Asn Asp Ile Gln Ala Asn Met Glu Gln Ala Met Gly Ile Ala Lys Gly  
 20 25 30  
 Tyr Leu Ala Asn Gln Glu Asn Val Met Asn Pro Ala Thr Trp Ser Gly  
 35 40 45  
 Thr Gly Val Val Ala Ser His Met Thr Ala Thr Glu Ile Thr Asn Glu  
 50 55 60  
 Leu Asn Lys Val Leu Thr Gly Gly Thr Arg Leu Ala Glu Gly Leu Val  
 65 70 75 80  
 Gln Ala Ala Ala Leu Met Glu Gly His Glu Ala Asp Ser Gln Thr Ala  
 85 90 95  
 Phe Gln Ala Leu Phe Gly Ala Ser His Gly Ser  
 100 105

<210> 28  
 <211> 273  
 <212> DNA  
 <213> M. tuberculosis

<220>  
 <221> CDS  
 <222> (1)...(273)

<400> 28  
 gtg gat ccg acc gtg ttg gct gat gcg gtg gcg cgg atg gcc gaa ttc 48  
 Val Asp Pro Thr Val Leu Ala Asp Ala Val Ala Arg Met Ala Glu Phe  
 1 5 10 15  
 ggt cgc cac gtc gag gag ctg gtc gcc gag att gag tcc ttg gtt acc 96  
 Gly Arg His Val Glu Glu Leu Val Ala Glu Ile Glu Ser Leu Val Thr  
 20 25 30  
 cgg ctg cat gtg acg tgg acg ggg gag ggc gcg gcg gct cat gct gag 144  
 Arg Leu His Val Thr Trp Thr Gly Glu Gly Ala Ala Ala His Ala Glu  
 35 40 45  
 gcg caa cga cat tgg gct gcc ggt gag gcg atg atg cgc cag gcg ttg 192  
 Ala Gln Arg His Trp Ala Ala Gly Glu Ala Met Met Arg Gln Ala Leu  
 50 55 60  
 gcc cag ctc acg gcc gcg ggg cag agc gcg cac gcc aac tac acc ggc 240  
 Ala Gln Leu Thr Ala Ala Gly Gln Ser Ala His Ala Asn Tyr Thr Gly  
 65 70 75 80  
 gcg atg gcc acg aat ttg ggt atg tgg tcg tga 273  
 Ala Met Ala Thr Asn Leu Gly Met Trp Ser  
 85 90

<210> 29  
 <211> 90

# 2010\_11\_15\_Sequence\_Listing

<212> PRT

<213> M. tuberculosis

<400> 29

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Met Asp Pro Thr Val Leu Ala Asp Ala Val Ala Arg Met Ala Glu Phe
 1      5      10     15
Gly Arg His Val Glu Glu Leu Val Ala Glu Ile Glu Ser Leu Val Thr
      20     25     30
Arg Leu His Val Thr Trp Thr Gly Glu Gly Ala Ala Ala His Ala Glu
      35     40     45
Ala Gln Arg His Trp Ala Ala Gly Glu Ala Met Met Arg Gln Ala Leu
      50     55     60
Ala Gln Leu Thr Ala Ala Gly Gln Ser Ala His Ala Asn Tyr Thr Gly
      65     70     75     80
Ala Met Ala Thr Asn Leu Gly Met Trp Ser
      85     90

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<210> 30

<211> 312

<212> DNA

<213> M. tuberculosis

<220>

<221> CDS

<222> (1)...(312)

<400> 30

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atg ggt gcc gac gac acg ctg cgc gta gag cct gcg gtg atg cag ggt      48
Met Gly Ala Asp Asp Thr Leu Arg Val Glu Pro Ala Val Met Gln Gly
 1      5      10     15

ttc gcc gcg tcg ttg gat gga gcg gcc gag cat ctc gcg gtt caa ctg      96
Phe Ala Ala Ser Leu Asp Gly Ala Ala Glu His Leu Ala Val Gln Leu
      20     25     30

gcc gag ctg gac gct cag gtc ggg cag atg ttg ggc ggg tgg cgc ggg      144
Ala Glu Leu Asp Ala Gln Val Gly Gln Met Leu Gly Gly Trp Arg Gly
      35     40     45

gcg tcg ggc agt gcg tat ggc tcg gcg tgg gag cta tgg cat cgc ggg      192
Ala Ser Gly Ser Ala Tyr Gly Ser Ala Trp Glu Leu Trp His Arg Gly
      50     55     60

gcc ggt gag gtg cag ctg gga ttg tcg atg ctg gcg gcg gcg ata gct      240
Ala Gly Glu Val Gln Leu Gly Leu Ser Met Leu Ala Ala Ala Ile Ala
      65     70     75     80

cac gcc ggt gcg ggt tat caa cac aac gag acc gcg tcg gcg cag gtg      288
His Ala Gly Ala Gly Tyr Gln His Asn Glu Thr Ala Ser Ala Gln Val
      85     90     95

ctt cgt gag gtg ggc ggt ggc tga      312
Leu Arg Glu Val Gly Gly Gly
      100

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<210> 31

<211> 103

<212> PRT

<213> M. tuberculosis

<400> 31

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Met Gly Ala Asp Asp Thr Leu Arg Val Glu Pro Ala Val Met Gln Gly

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# 2010\_11\_15\_Sequence\_Listing

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1      5      10      15
Phe Ala Ala Ser Leu Asp Gly Ala Ala Glu His Leu Ala Val Gln Leu
20
Ala Glu Leu Asp Ala Gln Val Gly Gln Met Leu Gly Gly Trp Arg Gly
35
Ala Ser Gly Ser Ala Tyr Gly Ser Ala Trp Glu Leu Trp His Arg Gly
50
Ala Gly Glu Val Gln Leu Gly Leu Ser Met Leu Ala Ala Ala Ile Ala
65
His Ala Gly Ala Gly Tyr Gln His Asn Glu Thr Ala Ser Ala Gln Val
80
Leu Arg Glu Val Gly Gly Gly
100

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<210> 32  
 <211> 26  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> Synthetic cloning primer

<400> 32  
 ctgagatcta tgagcctttt ggatgc 26

<210> 33  
 <211> 31  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> Synthetic cloning primer

<400> 33  
 ctaagcttgg atcctcagaa cccggtatag g 31

<210> 34  
 <211> 30  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> Synthetic cloning primer

<400> 34  
 ctgagatcctt tgatccccgg tcggatggtg 30

<210> 35  
 <211> 30  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> Synthetic cloning primer

<400> 35  
 ctcccatggg tcaggtgatc gaatcagcca 30

<210> 36  
 <211> 25  
 <212> DNA  
 <213> Artificial Sequence

# 2010\_11\_15\_Sequence\_Listing

<220>  
 <223> Synthetic cloning primer  
  
 <400> 36  
 ctgagatcta tgaccatcaa ctatc 25  
  
 <210> 37  
 <211> 32  
 <212> DNA  
 <213> Artificial Sequence  
  
 <220>  
 <223> Synthetic cloning primer  
  
 <400> 37  
 ctaagcttgg atccttaggc ccagctggag cc 32  
  
 <210> 38  
 <211> 25  
 <212> DNA  
 <213> Artificial Sequence  
  
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 <223> Synthetic cloning primer  
  
 <400> 38  
 ctgagatcta tgaccatcaa ctatc 25  
  
 <210> 39  
 <211> 32  
 <212> DNA  
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 <223> Synthetic cloning primer  
  
 <400> 39  
 ctaagcttgg atcctcaggc ccagctggag cc 32  
  
 <210> 40  
 <211> 30  
 <212> DNA  
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 <220>  
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 <400> 40  
 ctgagatctg tgcttttgcc tcttggtccg 30  
  
 <210> 41  
 <211> 27  
 <212> DNA  
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 <220>  
 <223> Synthetic cloning primer  
  
 <400> 41  
 cccaagcttc tagccggccg ccggaga 27  
  
 <210> 42  
 <211> 30



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<212> DNA  
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 <220>  
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 <400> 42  
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 <210> 43  
 <211> 31  
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 <400> 44  
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 <210> 45  
 <211> 30  
 <212> DNA  
 <213> Artificial Sequence  
  
 <220>  
 <223> Synthetic cloning primer  
  
 <400> 45  
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 <211> 30  
 <212> DNA  
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 <400> 46  
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# 2010\_11\_15\_Sequence\_Listing

<210> 48  
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 <212> DNA  
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 <400> 48  
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 <210> 49  
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 <212> DNA  
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 <400> 49  
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 <400> 51  
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 ctgagatcta tgtcagatca aatcacg 27  
  
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# 2010\_11\_15\_Sequence\_Listing

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<400> 54 ctgagatcta tggcagacac aattcagg	28
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<210> 56 <211> 28 <212> DNA <213> Artificial Sequence	
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<400> 56 ctgagatcta tggatccgac cgtgttgg	28
<210> 57 <211> 25 <212> DNA <213> Artificial Sequence	
<220> <223> Synthetic cloning primer	
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<210> 58 <211> 26 <212> DNA <213> Artificial Sequence	
<220> <223> Synthetic cloning primer	
<400> 58 ctgagatcta tgggtgccga cgacac	26
<210> 59 <211> 30 <212> DNA <213> Artificial Sequence	

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<220>

<223> Synthetic cloning primer

<400> 59

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30